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Orbital Dynamics of the α Andromeda Binary System Using the Palomar Testbed Interferometer

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The Palomar Testbed Interferometer is a 110-meter baseline K-Band infrared interferometer located at Palomar Mountain, California. In its simplest operating mode it yields unphased visibilities of target stars with a fringe spacing of ~ 4.6 milliarcseconds. Coupled with radial velocity measurements obtained from the literature it is possible to unravel the orbital dynamics of spectroscopic binary (SB2) systems whose components are separated by more than the fringe spacing. During the 1999 observing season, α Andromedae, a B8 IV mnp spectral class SB2, was observed over 74 nights during its 96.7 day orbital period. The maximum separation of the components is 24.15 ± 0.13 milliarcseconds which made it the furthest angularly-separated SB system characterized by PTI. This presentation will discuss the relationships of the raw data to unphased visibilities and baseline orientation which combined with the semi-amplitudes, K1 and K2, allow computation of the orbital parameters. Animations, using IDL, have been made of this data to illustrate how the measured visibilities, at a particular baseline orientation, relate to the positions of the components during its orbital period.